

What is claimed is:

[Claim 1] 1. A method of growing a gate oxide layer, comprising:
providing a semiconductor substrate having thereon at least one silicon active area;
cleaning said silicon active area to obtain a clean silicon active area;
performing a preliminary anneal process, wherein said semiconductor substrate is placed in an airtight chamber, N_2O gas is introduced into said airtight chamber such that said silicon active area is in contact with said N_2O gas, wherein after performing said preliminary anneal process, a nitrogen oxide thin layer with limited nitrogen-silicon bonds is formed on said silicon active area; and
growing a gate oxide layer on said nitrogen oxide thin layer.

[Claim 2] 2. The method of claim 1 wherein said preliminary anneal process is carried out at a low pressure of equal to or less than 0.2 Torr.

[Claim 3] 3. The method of claim 1 wherein said preliminary anneal process is carried out at a temperature of less than 1000°C.

[Claim 4] 4. The method of claim 1 wherein said N_2O gas introduced into said airtight chamber has a flow rate of about 10~8000sccm.

[Claim 5] 5. The method of claim 1 wherein said preliminary anneal process is carried out at a ramp rate of 5°C/min to 100°C/min.

[Claim 6] 6. A method of forming a gate oxide layer, comprising:
providing a semiconductor substrate having thereon at least one active area;
cleaning said silicon active area;

performing a preliminary anneal process, wherein said semiconductor substrate is placed in an airtight chamber, NO gas is introduced into said airtight chamber such that said silicon active area is in contact with said NO gas, wherein after performing said preliminary anneal process, a nitrogen oxide thin layer with limited nitrogen-silicon bonds is formed on said silicon active area; and

growing a gate oxide layer on said nitrogen oxide thin layer.

[Claim 7] 7. The method of claim 6 wherein said preliminary anneal process is carried out at a low pressure of equal to or less than 0.2 Torr.

[Claim 8] 8. The method of claim 6 wherein said preliminary anneal process is carried out at a temperature that is less than 1000°C.

[Claim 9] 9. The method of claim 6 wherein said NO gas introduced into said airtight chamber has a flow rate of about 10~8000sccm.

[Claim 10] 10. The method of claim 6 wherein said preliminary anneal process is carried out at a ramp rate of 5°C/min to 100°C/min.